Numbers of Atlantic Salmon Ascending the Tobique Narrows Fishway, Saint John River System, N.B., 1978-83

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The correct citation appears above the abstract of each report.

Rapport statistique canadien des sciences halieutiques et aquatiques

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Le titre exact paraît au haut du résumé de chaque rapport.

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ABSTRACT

Francis, A.A. 1984. Numbers of Atlantic salmon ascending the Tobique Narrows fishway, Saint John River System, N.B., 1978-83. Can. Data Rep. Fish. Aquat. Sci. No. 475. vii + 15 p.

This report provides a description of the Tobique Narrows Hydro Dam, adjacent fishway and fish enumeration facilities. Daily and summary counts of Atlantic salmon ascending the fishway are tabulated for the years 1978-83.

Key words: Saint John River system, Tobique Narrows Hydro Dam, Tobique Narrows Dam fishway, counting trap, Atlantic salmon.

RÉSUMÉ

Francis, A.A. 1984. Numbers of Atlantic salmon ascending the Tobique Narrows fishway, Saint John River System, N.B., 1978-83. Can. Data Rep. Fish. Aquat. Sci. No. 475. vii + 15 p.

Le barrage hydro-électrique des étroits de la rivière Tobique, ainsi que la passe migratoire et les installations de comptage des poissons qui lui sont adjacentes, sont décrits dans le présent rapport. On y trouvera en outre, résumés sous forme de tableau, le nombre quotidien des saumons qui ont remontés la passe migratoire entre 1978 à 1983.

INTRODUCTION

The international and interprovincial characteristics of the Saint John River drainage basin and the sequence and nature of hydroelectric developments at various strategic locations (Fig. 1) in the drainage are described by Dominy (1973), Ruggles and Watt (1975) and Penney (1976).

The Tobique Narrows Hydroelectric Dam is located about 0.8 km above the confluence of the Tobique and Saint John rivers (Fig. 1). Construction of the dam and related fish-passage facilities was completed in 1952.

Counting of the ascending salmon at the dam began in 1953 and continued through 1968 (Smith 1979). After a nine-year break, counting was resumed during the years 1978-83.

This report provides a description of the Tobique Narrows fish-passage and enumeration facilities and daily counts of one-sea-winter (1-SW) and multi-sea-winter (M-SW) salmon of both wild and hatchery origin, 1978-83.

DESCRIPTION OF DAM AND FISHWAY

The dam is a reinforced concrete structure, designed to operate under a head of 24 m (78 ft). Fish-passage facilities consist of a collection gallery at the base of the dam and a pool-and-weir fishway extending to the headpond above the dam (Fig. 2). The reinforced concrete fishway is about 357 m (1,170 ft) in length. The width is 2.4 m (8 ft). Within is a series of partitions or baffles to break the force of the water flow and assist fish in their ascent. On each of the four turns of the fishway is a large holding or resting pool. A minimum depth of 1.5 m (5 ft) of water is maintained by a system of water-control gates and valves. As a security precaution, the fishway was completely covered with metal grating panels prior to the 1979 salmon run.

The counting trap used from 1978 to 1980 was a wooden structure, constructed locally, according to Department of Fisheries and Oceans Plan No. M-B-9, 1955. The trap had a floating floor that could be raised for observation and handling of fish. It was fitted to the upstream end or exit of the fishway and was designed to catch only 1-SW and larger fish. Smaller fish easily passed through the slots of the trap walls and were uncounted. When operational, the trap was fished manually and was normally checked one or more times daily, with some exceptions on weekends and low-run periods. All fish were released directly into the headpond.

A metal trap (Fig. 3), DFO Plan No. M-2446, was installed in 1981. This trap was placed in the top resting pool of the fishway, 75 m (246 ft) below the fishway exit. It is fished by elevating the complete facility with a manual winch supported above the trapping area. Normally this trap was also fished daily, according to intensity of the run. After each check and count, the fish were released directly into the upstream area of the resting pool so that they could continue their migration through the remaining portion of the fishway and into the headpond.

PRESENTATION OF DATA

Use of the fishway by salmon is dependent on the upriver trucking of fish from the fish-collection facility at Mactaquac Dam (Fig. 1). Counts of salmon were dependent on the installation of the counting trap into the fishway. Trap installation dates (Table 1) generally preceded the estimated arrival time of the first fish released above Mactaquac in each year. Trap removal dates were between October 27 and November 10 (Table 1) and in some cases may have denied access to a few migrants destined for the Tobique River.

Table 2 provides semi-monthly and annual totals of 1-SW and M-SW salmon which ascended the Tobique Narrows Fishway, 1978-83. Daily tabulations by origin, i.e., wild fish with an adipose fin, hatchery fish without an adipose fin, appear in Appendix A.

Table 3 provides monthly counts of 1-SW and M-SW salmon (combined) for the years 1953-68 (Smith 1979), when the wooden counting trap was in use in the fishway exit. Monthly totals from 1978 to 1983 have been added.

During the years 1978-83, a number of fish counted through the Tobique Narrows fishway bore tags. Tagged fish were the by-product of mark-recapture studies by various investigators. These fish were originally tagged for studies of the main-stem sport fishery and the Kingsclear Indian fishery below Mactaquac, the Mactaquac Dam and migration channel, the sport fishery between Woodstock and Beechwood, the Beechwood fish-lift, "fallback" from above Beechwood, and the sport fishery in the Tobique River. All tagged fish from the fishway are tabulated according to their sea-age, origin (hatchery or wild), date of capture, last point of release, and elapsed time since release (Appendix B). Principle objectives of specific mark-recapture studies are footnoted in Appendix Tables B-1 to B-4.

TABLE 1. Operating periods and dates of the first and last 1-SW and M-SW salmon ascending Tobique Narrows fishway, 1978-83.

Year	Dates					
	Trap installed	Trap removed	1-SW fish		M-SW fish	
			First	Last	First	Last
1978	23 Jun	2 Nov	7 Jul	26 Oct	14 Jul	29 Oct
1979	4 Jul	7 Nov	7 Jul	7 Nov	7 Jul	1 Nov
1980	20 Jun	10 Nov	26 Jun	30 Oct	22 Jun	30 Oct
1981	15 Jun	9 Nov	3 Jul	26 Oct	16 Jun	21 Oct
1982	25 Jun	9 Nov	8 Jul	8 Nov	28 Jun	1 Nov
1983	29 Jun	27 Oct	11 Jul	27 Oct	11 Jul	26 Oct

TABLE 2. Semi-monthly and annual totals of 1-SW and M-SW salmon ascending Tobique Narrows fishway, 1978-83. (A dash indicates the trap was not in fishing order; a zero indicates no count with the trap fishing.)

Year	Age	Numbers of fish										
		Jun	Jul		Aug		Sep		Oct		Nov	
		15-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	Total
1978	1-SW	0	3	68	38	13	16	59	66	19	0	282
	M-SW	0	5	104	43	8	20	92	55	13	0	340
	Total	0	8	172	81	21	36	151	121	32	0	622
1979	1-SW	-	75	230	64	114	80	65	184	92	6	910
	M-SW	-	63	48	7	6	10	12	29	27	1	203
	Total	-	138	278	71	120	90	77	213	119	7	1,113
1980	1-SW	3	15	79	301	326	128	110	121	91	0	1,174
	M-SW	47	144	161	113	47	19	40	29	32	0	632
	Total	50	159	240	414	373	147	150	150	123	0	1,806
1981	1-SW	0	10	135	70	48	69	102	20	27	0	481
	M-SW	4	10	19	4	2	4	12	2	6	0	63
	Total	4	20	154	74	50	73	114	22	33	0	544
1982	1-SW	0	87	76	200	112	49	110	88	24	13	759
	M-SW	1	50	7	3	3	3	4	6	2	1	80
	Total	1	137	83	203	115	52	114	94	26	14	839
1983	1-SW	0	9	100	58	18	46	63	111	96	-	501
	M-SW	0	8	5	2	0	1	7	14	19	-	56
	Total	0	17	105	60	18	47	70	125	115	0	557

TABLE 3. Monthly and annual totals of salmon ascending Tobique Narrows fishway, 1953-83. (1953-68 from Smith 1979.)

Year[a]	Numbers of fish							
	May	June	July	August	September	October	November	Totals
1953	58	1,866	1,979	228	106	384	35	4,656
1954	79	1,052	1,542	1,288	836	184	5	4,986
1955	13	682	1,376	858	270	555	21	3,775
1956	2	376	1,326	751	731	467	70	3,723
1957	0	4	8	314	216	25	2	569
1958	0	61	646	824	923	146	32	2,632
1959	0	2	288	43	383	222	11	949
1960	0	40	544	148	54	259	75	1,120
1961	0	85	195	108	266	87	6	747
1962	0	26	79	33	43	82	1	264
1963	0	21	1,278	775	1,195	554	4	3,827
1964	0	56	1,919	2,262	816	217	31	5,301
1965	0	271	1,428	64	1,144	466	7	3,380
1966	0	120	132	10	10	502	6	780
1967	0	0	0	0	0	0	0	0
1968[b]	-	-	-	-	-	-	-	18
1978	-	0	180	102	187	153	0	622
1979	-	-	416	191	167	332	7	1,113
1980	-	50	399	787	297	273	0	1,806
1981	-	4	174	124	187	55	0	544
1982	-	1	220	318	166	120	14	839
1983	-	-	122	78	117	240	-	557

[a]Wooden trap in use, 1953-80; metal trap in use, 1981-83.
[b]Monthly counts unavailable.

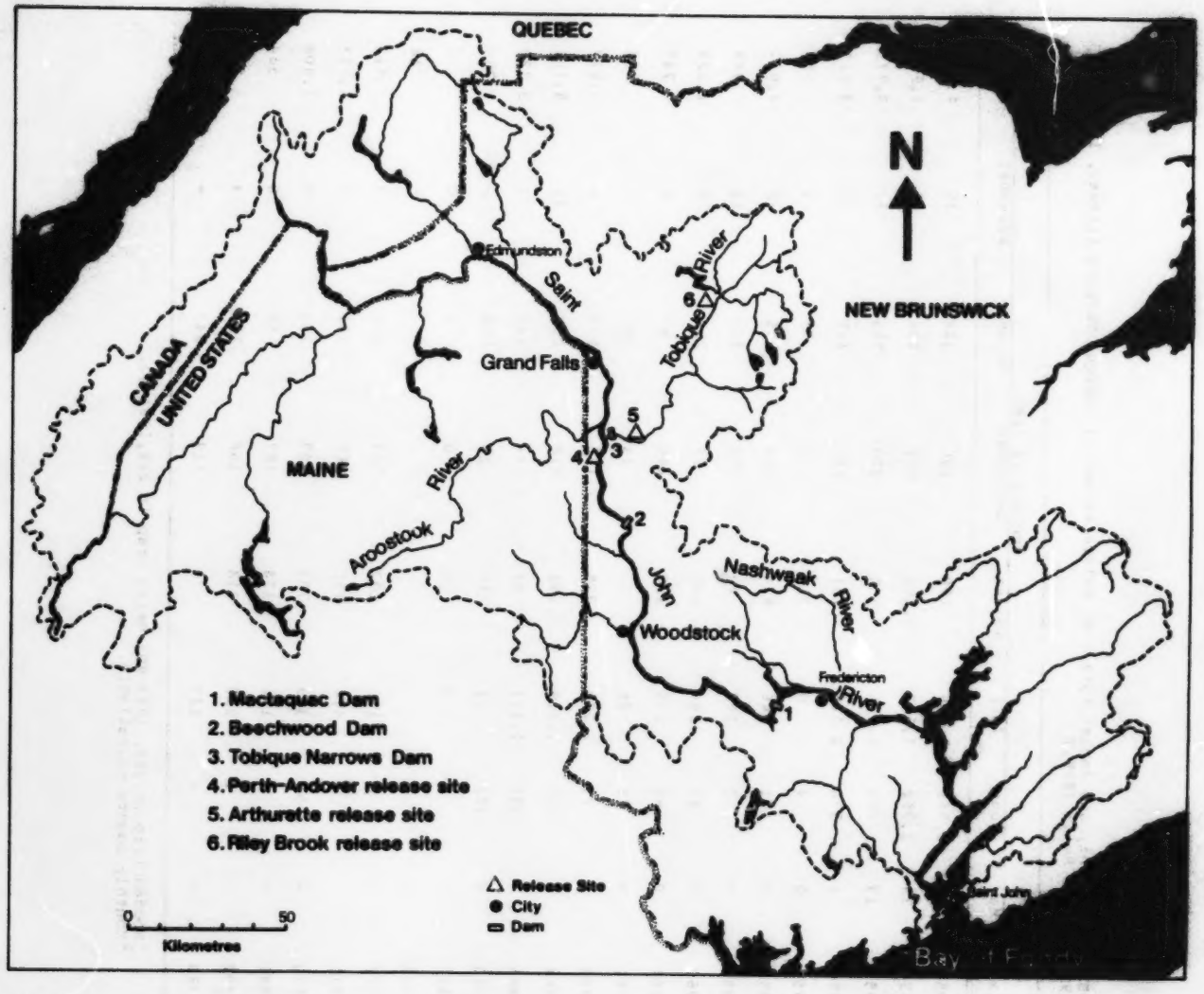

FIG. 1. Major power dams and salmon release sites, Saint John River System, New Brunswick.

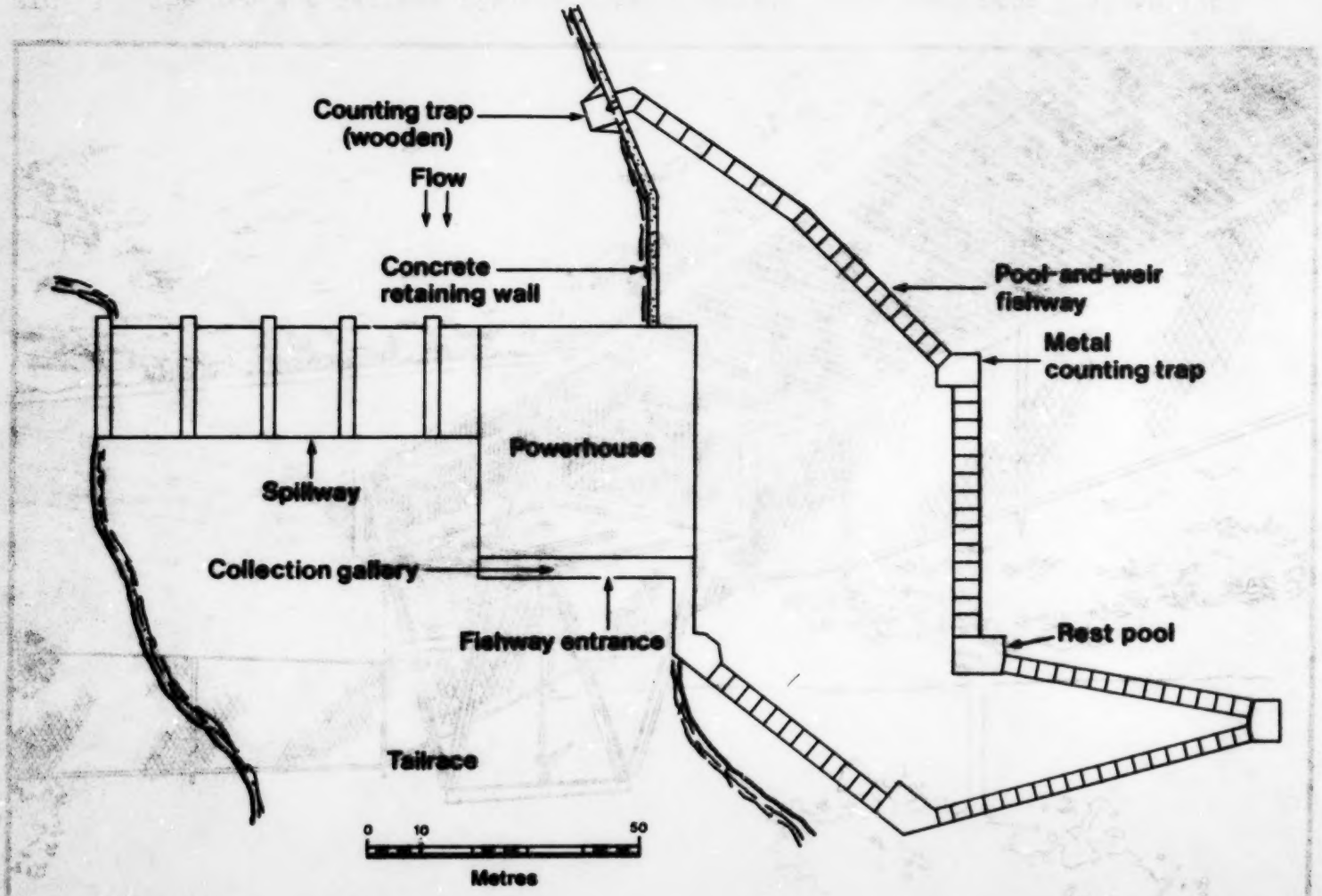

FIG. 2. Site plan of the Tobique Narrows Hydro Dam and pool-and-weir fishway, showing counting trap locations.

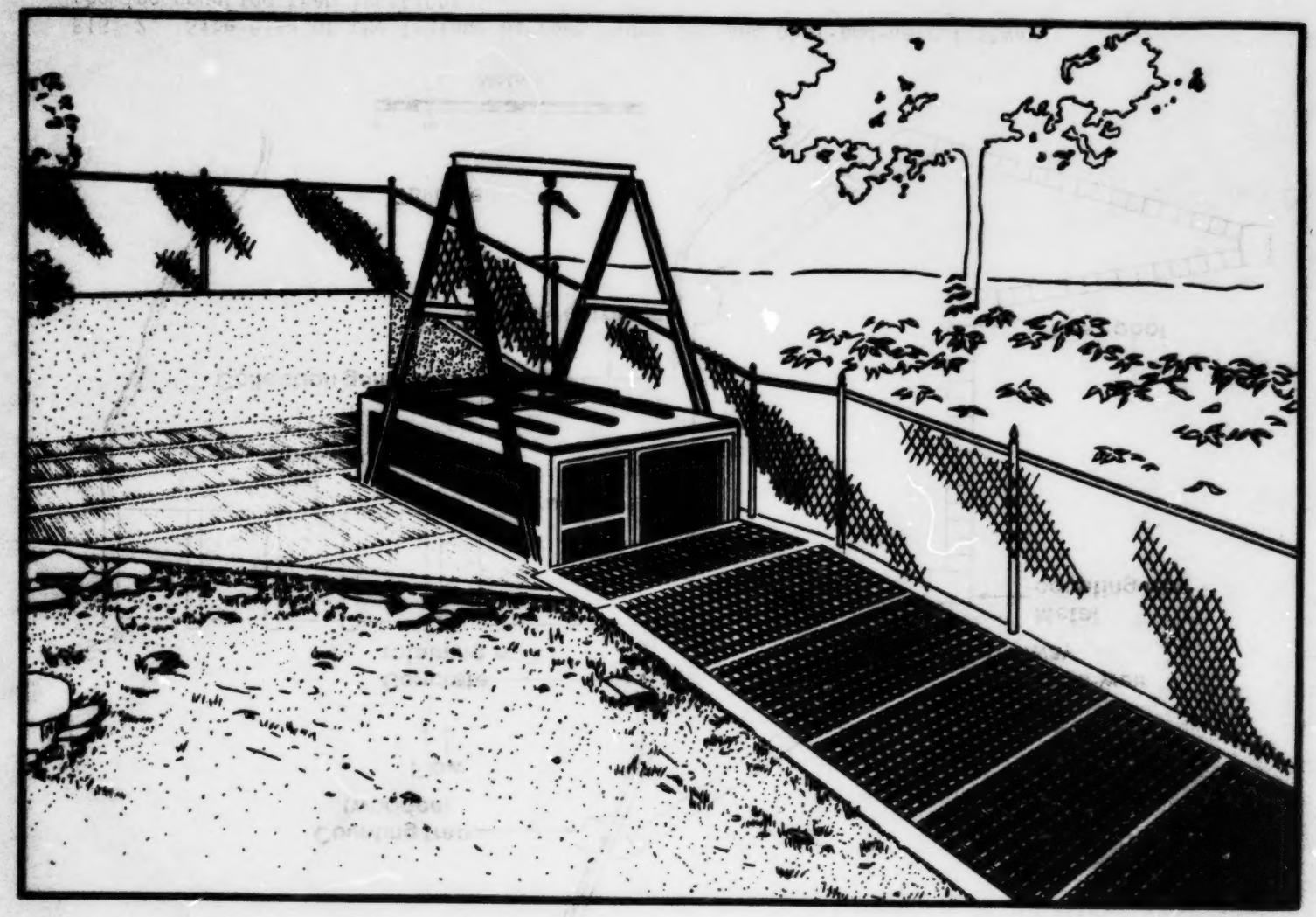

FIG. 3. The Tobique Narrows fishway metal counting trap, used from 1981 to 1983, showing its location in the fishway.

APPENDIX A

DAILY COUNTS OF 1-SW AND M-SW SALMON OF WILD AND HATCHERY ORIGIN ASCENDING THE TOBIQUE NARROWS FISHWAY, NEW BRUNSWICK, 1978-83

This appendix tabulates the number of 1-SW and M-SW salmon on a daily basis, 1978-83. Fish are categorized as being of wild or hatchery origin -- the latter distinguishable by the absence of the adipose fin.

TABLE A-1. Daily counts of 1-SW and M-SW salmon of wild (W) and hatchery (H) origin ascending the Tobique Narrows fishway, New Brunswick, 1978-83. (Dashes suggest zero fish taken; blanks indicate the non-operating periods of the counting trap.)

Date	1978				1979				1980				1981				1982				1983			
	1-SW		M-SW		1-SW		M-SW		1-SW		M-SW		1-SW		M-SW		1-SW		M-SW		1-SW		M-SW	
	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H
June																								
15													-	-	-	-								
16													-	-	1	-								
17													-	-	-	-								
18													-	-	-	-								
19													-	-	-	-								
20									-	-	-	-	-	-	-	-								
21									-	-	-	-	-	-	-	-								
22									-	-	-	-	-	-	1	-								
23	-	-	-	-					-	-	3	-	-	-	1	-								
24	-	-	-	-					-	-	5	-	-	-	-	-								
25	-	-	-	-					-	-	5	-	-	-	-	-								
26	-	-	-	-					-	-	10	-	-	-	-	-	-	-	-	-				
27	-	-	-	-					1	-	5	-	-	-	-	-	-	-	-	-				
28	-	-	-	-					-	-	2	-	-	-	-	-	-	-	-	-				
29	-	-	-	-					-	-	5	-	-	-	-	-	-	-	1	-				
30	-	-	-	-					2	-	4	-	-	-	1	-	-	-	-	-	-	-	-	-
July																								
1	-	-	-	-					1	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-
2	-	-	-	-					-	-	12	-	-	-	-	-	-	-	1	-	-	-	-	-
3	-	-	-	-					-	-	6	-	1	-	1	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	3	-	27	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	8	-	-	-	1	-	-	-	1	-	-	-	-	-
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7	1	-	-	-	1	-	3	-	1	-	12	-	-	-	-	-	-	-	12	-	-	-	-	-
8	-	-	-	-	1	-	3	-	1	-	4	-	1	-	2	-	1	-	9	-	-	-	-	-
9	-	-	-	1	-	-	6	-	-	-	11	-	-	-	1	-	1	-	5	-	-	-	-	-
10	1	-	-	-	-	-	-	-	2	-	28	-	-	-	-	-	1	-	-	-	-	-	-	-
11	-	-	-	-	10	-	10	-	2	-	3	-	-	-	-	-	5	-	9	-	3	-	2	-
12	-	-	-	-	6	-	7	-	-	-	1	-	2	-	2	-	19	-	5	-	-	-	-	-
13	-	-	-	-	21	-	14	-	-	-	5	-	1	-	-	-	29	-	2	-	-	-	1	-
14	1	-	2	-	26	-	15	3	2	-	12	1	-	-	1	-	13	-	1	-	1	-	2	-
15	-	-	2	-	9	1	2	-	-	-	4	-	1	-	-	-	18	-	5	-	5	-	3	-
16	-	-	-	-	6	-	3	-	-	-	1	-	4	-	-	-	15	-	1	-	-	-	-	-
17	2	-	3	-	-	-	-	-	-	-	1	-	5	1	4	-	7	-	2	-	-	-	-	-
18	-	-	-	-	15	-	2	-	3	-	11	-	4	-	-	-	13	-	1	-	7	-	3	-
19	-	-	1	-	20	-	2	-	4	-	8	-	1	-	2	-	2	-	-	-	20	-	1	-
20	-	-	-	-	34	-	2	-	1	-	12	-	14	-	1	-	8	-	-	-	8	-	1	-
21	-	-	-	-	21	-	5	-	1	1	4	1	3	-	-	-	7	1	-	-	1	-	-	-
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31	10	1	7	1	4	-	-	-	8	1	2	1	5	-	1	-	1	-	-	-	25	-	-	-
Aug																								
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4	-	-	-	-	7	-	-	-	37	1	12	1	26	3	2	-	11	-	1	-	7	-	-	-
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19	1	-	-	-	3	-	-	-	10	1	5	-	1	-	-	-	17	1	-	-	-	-	-	-
20	-	-	2	-	8	-	2	-	6	-	2	-	-	-	-	-	4	-	-	-	3	-	-	-

TABLE A-1. Continued.

Date	1978				1979				1980				1981				1982				1983			
	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
Aug																								
21	5	-	-	-	7	-	-	-	15	-	-	-	-	-	-	-	16	1	-	-	-	-	-	-
22	1	-	-	-	6	-	-	-	18	2	1	-	-	-	-	-	4	-	-	-	1	-	-	-
23	1	-	1	1	2	-	-	-	10	1	4	-	-	-	-	-	12	-	-	-	2	-	-	-
24	-	-	-	-	15	-	-	-	-	-	-	-	4	-	-	-	6	1	-	-	1	-	-	-
25	1	-	-	-	4	-	-	-	28	2	12	-	-	1	-	-	4	2	1	-	-	-	-	-
26	-	-	-	-	12	-	-	-	11	-	-	-	3	-	-	-	9	-	-	-	3	1	-	-
27	-	-	-	-	20	1	2	-	10	-	1	-	1	-	-	-	7	-	1	-	-	-	-	-
28	-	-	-	-	6	-	-	-	23	1	4	-	-	2	-	-	-	-	-	-	-	-	-	-
29	-	-	-	-	7	-	-	-	48	4	4	1	4	-	-	-	4	-	-	-	2	1	-	-
30	-	-	-	-	9	-	1	-	35	1	5	-	9	-	1	1	1	-	-	-	1	-	-	-
31	-	-	-	-	6	-	-	-	11	4	1	-	7	-	-	-	1	-	-	-	1	-	-	-
Sept																								
1	-	-	-	-	5	-	-	-	6	-	1	-	5	-	-	-	1	-	-	-	3	-	-	-
2	1	-	-	-	6	-	-	-	2	-	-	-	12	5	3	-	1	-	-	-	2	-	1	-
3	-	-	-	-	2	-	1	-	8	2	4	-	1	-	-	-	-	-	-	-	2	-	-	-
4	1	-	1	-	16	-	-	-	15	3	1	-	1	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	9	-	2	1	12	-	2	-	-	-	-	-	1	-	-	-	7	1	-	-
6	-	-	1	-	1	-	1	-	5	-	-	-	2	1	-	-	-	-	-	-	8	-	-	-
7	4	-	-	-	1	-	-	-	6	1	-	-	3	-	-	-	-	-	-	-	-	-	-	-
8	2	-	6	-	17	-	2	-	23	2	2	-	19	4	1	-	1	-	-	-	-	2	-	-
9	3	-	2	-	-	-	-	-	5	-	1	-	-	-	-	-	4	-	-	-	2	-	-	-
10	1	-	4	-	3	-	-	-	6	1	-	-	1	-	-	-	2	-	-	-	-	-	-	-
11	-	-	2	-	2	-	-	-	1	-	3	-	3	-	-	-	-	-	-	1	-	-	-	-
12	-	1	1	-	2	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	9	1	-	-
13	2	1	2	-	-	-	-	-	1	-	-	-	11	-	-	-	8	-	-	-	3	-	-	-
14	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	9	-	-	-	6	-	-	-
15	-	-	1	-	15	-	2	-	20	6	4	-	1	-	-	-	20	2	-	1	2	-	-	-
16	2	-	2	-	3	-	2	-	4	-	4	-	2	1	1	-	20	18	-	-	3	-	2	-
17	2	-	6	1	5	-	-	-	1	1	-	-	6	3	1	-	-	-	1	-	-	-	-	-
18	-	1	1	-	3	-	-	-	1	-	1	-	3	2	-	-	-	-	-	-	-	-	-	-
19	1	1	2	3	-	1	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	1	-	8	-	5	-	1	-	-	-	-	-	6	2	-	-	-	-	-	-	15	2	-	-
21	-	1	2	-	7	1	-	-	15	2	4	-	1	-	-	-	2	-	-	-	4	-	-	-
22	6	-	8	-	13	1	3	-	10	3	5	-	6	2	1	-	4	1	-	-	3	1	1	1
23	6	2	9	-	-	-	-	-	1	2	2	-	3	2	2	-	6	-	1	-	1	-	-	-
24	2	-	9	-	7	1	1	-	18	2	11	-	10	4	1	-	6	-	-	-	10	4	1	-
25	2	-	3	-	6	1	4	-	21	4	4	-	5	3	1	-	-	-	-	-	-	-	-	-
26	4	-	9	1	-	-	-	-	3	1	1	-	-	-	-	-	-	-	-	-	8	1	-	-
27	8	4	9	3	1	-	-	-	-	1	1	-	16	9	1	-	33	3	-	-	9	1	1	-
28	4	3	3	2	2	-	1	-	-	-	2	-	5	4	1	-	5	1	1	-	1	1	-	-
29	5	1	4	-	5	-	-	-	6	1	-	-	6	-	2	1	2	-	-	-	12	1	1	-
30	2	1	6	1	3	-	-	-	11	-	5	-	1	-	-	-	3	-	-	-	9	3	1	-
Oct																								
1	1	2	8	-	2	-	2	-	5	-	1	-	4	1	-	-	3	-	-	-	-	-	-	-
2	1	3	3	-	9	1	7	-	1	-	1	-	1	-	-	-	-	-	-	-	16	-	3	-
3	2	2	6	3	49	3	-	-	2	-	1	-	-	-	-	-	-	-	-	-	8	-	1	-
4	7	3	4	-	7	-	2	-	1	-	1	-	-	-	-	-	-	-	-	-	2	-	1	-
5	2	1	2	-	4	-	1	-	-	-	-	-	1	-	-	-	10	-	-	-	2	-	-	-
6	2	3	3	1	7	-	-	-	2	1	1	-	1	-	-	-	10	-	-	-	4	-	1	-
7	4	1	3	1	-	-	-	-	36	5	4	-	-	-	-	-	4	-	-	-	9	-	-	-
8	1	3	9	-	6	-	1	-	15	3	5	-	9	1	-	-	-	-	-	-	-	-	-	-
9	1	1	2	1	15	2	1	-	11	1	5	-	-	-	-	-	7	-	1	-	32	7	5	-
10	6	5	2	-	42	3	6	-	10	3	5	-	-	-	-	-	-	-	-	-	7	1	-	-
11	1	1	3	-	5	-	2	-	3	1	2	-	-	-	-	-	16	7	1	-	-	-	-	-
12	2	4	-	-	12	-	3	-	-	-	-	-	-	-	-	-	12	3	2	-	10	-	3	-
13	-	4	1	-	-	-	-	-	18	3	3	-	-	-	-	-	10	2	-	1	8	-	1	-
14	1	2	2	1	3	1	1	-	-	-	-	-	2	-	2	-	1	-	1	-	4	-	-	-
15	-	-	-	-	12	1	2	1	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
16	-	-	-	-	10	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	4	1
17	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	1	-
18	-	1	1	-	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	3	3	1	-	3	-	-	-	5	-	-	-	5	1	4	1	4	1	-	-	17	2	5	1
20	-	1	2	-	-	-	-	-	2	1	3	-	-	-	-	-	1	-	-	-	8	1	1	-
21	1	-	1	-	2	-	-	-	-	-	-	-	11	1	1	-	-	-	-	-	2	1	1	-
22	-	2	1	-	1	-	-	-	-	-	-	-	8	-	-	-	-	-	-	-	1	-	1	-
23	-	3	-	-	9	-	4	-	20	3	6	-	-	-	-	-	6	-	1	-	-	-	-	-
24	-	1	-	-	8	-	2	-	24	1	6	-	-	-	-	-	-	-	-	-	22	-	4	1
25	-	2	3	-	14	1	5	-	-	-	-	-	-	-	-	-	5	4	1	-	4	1	1	1
26	-	2	3	-	7	-	-	-	16	-	9	-	1	-	-	-	1	1	-	-	1	-	3	-
27	-	-	-	-	-	-	-	-	9	-	5	-	-	-	-	-	-	-	-	-	6	-	-	-
28	-	-	-	-	21	-	-	4	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A-1. Continued.

Date	1978		1979		1980		1981		1982		1983	
Oct												
30	-	-	1	-	2	-	3	2	2	-	2	-	-	-	-	-	1	-	-	-
30	-	-	-	-	2	-	2	-	3	-	1	-	-	-	-	-	-	-	-	-
31	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nov												
1	-	-	-	-	3	-	1	-	-	-	-	-	-	-	-	-	9	-	1	-
2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
3					-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
4					-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
5					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6					1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7					1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8									-	-	-	-	-	-	-	-	1	-	-	-
9									-	-	-	-	-	-	-	-	-	-	-	-
10									-	-	-	-								

APPENDIX B

DATES OF CAPTURE AND ELAPSED TIMES FROM PREVIOUS RELEASE OF TAGGED 1-SW and M-SW SALMON OF WILD AND HATCHERY ORIGINS THAT ASCENDED THE TOBIQUE NARROWS FISHWAY, 1978-83

This appendix documents the passage of tagged salmon used in various mark-recapture studies either above or below the Tobique Narrows fishway, 1978-83. Except for four tags in 1983 (Table B-4), all were of the small blue Carlin type, attached with monofilament ties.

Documented release sites (Fig. 1) are restricted to those in which tagged fish were last released prior to their ascent of the Tobique Narrows fishway.

Sites include:

(1) Beechwood site - at the dumping point of the "skip-hoist" on the Beechwood Dam, approximately 29 km below the Tobique Narrows Dam;

(2) Perth-Andover site - on the true right bank of the main Saint John River, 0.4 km below the highway bridge at Perth-Andover and approximately 4.5 km below the entrance to the Tobique Narrows fishway;

(3) Arthurette site - on the north bank of the upper section of the Tobique Narrows Dam headpond - a distance of 5.7 km below the highway bridge at Arthurette;

(4) Riley Brook site - 88 km upstream of the Tobique Narrows Dam, at a point immediately above the village of Riley Brook.

Specific investigations with tag series which contributed to significant numbers of tagged fish ascending the Tobique Narrows fishway are footnoted for the years 1978, 1979 and 1983. Tags other than those were frequently the byproduct of either studies to evaluate the survival to adults of various lots of hatchery smolts reared at the Mactaquac Hatchery or returns of adult salmon tagged for study in previous years (i.e., repeat-spawning fish).

TABLE B-1. Dates of capture at and elapsed times to the Tobique Narrows fishway for tagged 1-SW and M-SW salmon of wild (W) and hatchery (H) origins released at the Beechwood and Arthurette sites, Saint John River, N.B., 1978.

Dates of capture[a]	Age	Origin	Tag No.[b]	Dates of previous release (Elapsed days to Tobique)	
				Beechwood	Arthurette
14 Jul	M-SW	W	T19882	10 Jul (4)	
17 Jul	1-SW	W	T19751	14 Jul (3)	
17 Jul	1-SW	W	M79019	--	
17 Jul	M-SW	W	T19788	10 Jul (7)	
24 Jul	M-SW	W	T19763	18 Jul (6)	
26 Jul	M-SW	W	T19885	10 Jul (16)	
26 Jul	M-SW	W	M79004	--	
26 Jul	1-SW	W	T19707	--	
26 Jul	M-SW	W	T19888	10 Jul (16)	
26 Jul	M-SW	W	T19875	23 Jul (3)	
26 Jul	M-SW	W	M79001	10 Jul (16)	
26 Jul	1-SW	W	T19881	17 Jul (9)	
26 Jul	1-SW	W	T19736	17 Jul (9)	
27 Jul	M-SW	W	M79248	24 Jul (3)	
27 Jul	M-SW	W	T19603		27 Jun (30)
27 Jul	M-SW	W	T19882	18 Jul (9)	
27 Jul	M-SW	W	M79013	23 Jul (4)	
27 Jul	M-SW	W	T19668		27 Jun (30)
27 Jul	1-SW	W	T19725	24 Jul (3)	
27 Jul	1-SW	W	T19782	11 Jul (16)	
27 Jul	M-SW	W	T19877		
27 Jul	M-SW	W	T19749		
28 Jul	1-SW	W	T19760	28 Jul (10)	
28 Jul	1-SW	W	T19716	23 Jul (5)	
28 Jul	1-SW	W	T19740	21 Jul (7)	
28 Jul	1-SW	W	T19738	24 Jul (4)	
28 Jul	1-SW	W	T19781	18 Jul (10)	
28 Jul	1-SW	W	T19840	18 Jul (10)	
28 Jul	1-SW	W	T19794	24 Jul (4)	
29 Jul	1-SW	W	T19743	26 Jul (3)	
29 Jul	M-SW	W	T19680		
30 Jul	M-SW	W	T19652		5 Jul (24)
31 Jul	1-SW	W	T19628	23 Jul (8)	27 Jun (33)
31 Jul	1-SW	W	T19742		27 Jun (34)
5 Aug	1-SW	W	T19702		
5 Aug	1-SW	W	M79154	3 Aug (2)	
5 Aug	1-SW	W	T19861	24 Jul (12)	
6 Aug	1-SW	W	T19704		
7 Aug	1-SW	W	T19785	26 Jul (12)	
10 Aug	1-SW	W	T19756	1 Aug (9)	
11 Aug	1-SW	W	T19794	25 Jul (17)	
17 Aug	1-SW	W	M79190	8 Aug (9)	
7 Sep	1-SW	W	T19755	25 Jul (44)	
9 Sep	1-SW	W	T19911		9 Jul (62)
10 Sep	M-SW	W	T19823	7 Sep (3)	
13 Sep	M-SW	W	T19821		
23 Sep	1-SW	H	H56231		26 Jul (59)
24 Sep	M-SW	W	T19805	10 Sep (6)	
25 Sep	M-SW	W	T19898	14 Sep (11)	
25 Sep	1-SW	W	T19727	22 Sep (3)	
26 Sep	M-SW	W	T19747	22 Sep (4)	
26 Sep	M-SW	W	T19877	25 Sep (1)	
27 Sep	M-SW	W	M79036	14 Sep (13)	
27 Sep	M-SW	W	T19838	25 Sep (2)	
27 Sep	1-SW	W	T19799	26 Jul (63)	
27 Sep	1-SW	W	T19971	17 Jul (72)	11 Jul (78)
29 Sep	1-SW	W	T19799	25 Sep (4)	
29 Sep	1-SW	H	H62396		26 Jul (65)
30 Sep	M-SW	W	T19831	28 Sep (2)	
1 Oct	M-SW	W	T19851	27 Sep (4)	
1 Oct	M-SW	W	T19771	28 Sep (3)	
3 Oct	M-SW	H	A34673	4 Sep (19)	
3 Oct	1-SW	W	T19741	16 Sep (5)	
4 Oct	1-SW	H	H63178		13 Sep (21)
5 Oct	1-SW	W	M79312	2 Oct (3)	

TABLE B-1. Continued

Dates of capture[a]	Age	Origin	Tag No.[b]	Dates of previous release (Elapsed days to Tobique) Beechwood	Arthurette
6 Oct	1-SW	H	H50974	28 Sep (8)	
6 Oct	M-SW	H	M79091	28 Sep (8)	
7 Oct	M-SW	H	K5333	28 Sep (9)	21 Jun (108)
8 Oct	1-SW	H	H60975		11 Jul (89)
9 Oct	1-SW	H	M79149	18 Sep (21)	
24 Oct	1-SW	H	H67273		11 Oct (13)
26 Oct	1-SW	H	M79402		13 Sep (43)

[a]One 1-SW fish escaped during handling on Jul 21.

[b]Tag numbers are principally from the series: (1) M79,000-79,564, in which 189 M-SW (W), 138 M-SW (H), 113 1-SW (W) and 124 1-SW (H) fish were released at the Bucket Club (Ingram 1984) to evaluate exploitation by anglers and the Kingsclear Indian Reserve immediately below Mactaquac; (2) T19,700-19,899, in which 100 M-SW (W) and 99 1-SW (W) fish were released at Woodstock to evaluate exploitation by anglers and wild and hatchery upriver movement; and (3) T19,600-19,699 and T19,900-19,999, in which 100 M-SW (W) and 100 1-SW (W) were used to evaluate the sport fishery on the Tobique River.

TABLE B-2. Dates of capture and elapsed times to the Tobique Narrows fishway for tagged 1-SW and M-SW salmon of wild (W) and hatchery (H) origins released at the Beechwood, Perth-Andover and Arthurette sites, Saint John River, N.B., 1979.

Dates of capture	Age	Origin	Tag No.	Dates of previous release (Elapsed days to Tobique) Beechwood	Perth-Andover[a]	Arthurette
5 Aug	M-SW	H	H48522	15 Jul (21)		
6 Aug	1-SW	H	M43611		1 Aug (5)	
11 Aug	1-SW	H	M38131		1 Aug (10)	
21 Aug	1-SW	W	V98836		1 Aug (20)	
22 Sep	M-SW	W	M79248	30 Jul (54)		
3 Oct	1-SW	H	P73958			12 Sep (21)
3 Oct	1-SW	H	M39364		1 Aug (63)	
28 Oct	M-SW	W	V98883	22 Oct (6)		
29 Oct	M-SW	H	H55333	29 Sep (30)		
6 Nov	1-SW	W	V98885	21 Oct (16)		

[a]Releases of 166 1-SW fish (H), of which some had been imprinted with morpholine, as smolts were used to evaluate the use of morpholine in the Tobique Narrows fishway as a method of reducing fallback of salmon of Mactaquac origin (Farmer, pers. comm.). An additional 5 1-SW (H) and 4 1-SW (W) were also released at the same location.

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TABLE B-3. Dates of capture at and elapsed times to the Tobique Narrows fishway for tagged 1-SW and M-SW salmon of wild (W) and hatchery (H) origins released at the Beechwood and Arthurette sites, Saint John River, N.B., 1980, 1981 and 1982.

Dates of capture	Age	Origin	Tag No.	Dates of previous release (Elapsed days to Tobique) Beechwood	Arthurette
1980					
25 Jun	M-SW	W	T19657	21 Jun (4)	
25 Jun	M-SW	W	T19615	23 Jun (2)	
4 Jul	M-SW	W	T19762	30 Jun (4)	
24 Jul	M-SW	H	M41861		30 Jun (24)
24 Jul	1-SW	H	M47950		30 Jun (24)
8 Aug	1-SW	H	M90842	1 Aug (7)	19 Jul (20)
25 Aug	1-SW	H	W02454		11 Aug (14)
30 Aug	1-SW	H	W00876		15 Jul (46)
10 Sep	1-SW	H	M91462		7 Aug (34)
15 Sep	1-SW	H	M91689		26 Aug (20)
22 Sep	1-SW	H	W03976		21 Aug (32)
23 Oct	1-SW	H	M95517	14 Aug (70)	
1981					
17 Jul	1-SW	H	W95711	13 Jul (4)	
7 Aug	1-SW	H	X37743	2 Aug (5)	
2 Sep	1-SW	H	W97531	28 Aug (5)	
2 Sep	1-SW	H	W91296		5 Aug (28)
2 Sep	1-SW	H	W95133	28 Aug (5)	
20 Sep	1-SW	H	W92665		5 Aug (46)
27 Sep	1-SW	H	X37377		10 Sep (17)
21 Oct	1-SW	H	W77268		10 Sep (41)
1982					
27 Sep	1-SW	H	X50240	21 Sep (6)	

TABLE B-4. Dates of capture at and elapsed times to the Tobique Narrows fishway for tagged 1-SW and M-SW salmon of wild (W) and hatchery (H) origins released at the Arthurette and Riley Brook sites, Saint John River, N.B., 1983.

Dates of capture	Age	Origin	Tag No.[a,b]	Dates of previous release (Elapsed days to Tobique) Riley Brook	Arthurette
22 Aug	1-SW	H	A96460	25 Jul (28)	
19 Sep	1-SW	H	A96433	25 Jul (56)	
19 Sep	1-SW	H	1245		4 Jul (77)
21 Sep	M-SW	H	1203		30 Jun (83)
26 Sep	1-SW	H	1224		4 Jul (84)
28 Sep	1-SW	H	1206		30 Jun (90)
9 Oct	1-SW	H	A96408	14 Jul (87)	
18 Oct	1-SW	H	Y52414		3 Oct (15)
24 Oct	M-SW	H	X43644		4 Jul (112)
26 Oct	1-SW	H	Y50334		3 Oct (23)

[a]Tags without alpha-prefixes are of the large yellow Carlin type.

[b]Fifty 1-SW and 49 M-SW fish of hatchery origin, identified by large, yellow Carlin tags; and 51 1-SW (H), 10 M-SW (W), 50 1-SW (W) and 50 M-SW (H), identified by an "A" prefix, tags were released to investigate migration and angler exploitation patterns in the Tobique River.

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